

### REMARKS

In response to the office action dated January 3, 2007, Applicant amended claims 1, 11, 16, 19, 59, 63, 67, 80, and 82, and cancelled claim 10. Claims 1-7, 9, 11, 13-29, 36-49, and 52-82 are presented for examination.

The Examiner objected to claim 10 as being of improper dependent form. Applicant has cancelled this claim, so the objection should be withdrawn.

The Examiner rejected claims 1-7, 9-11, 13-15, 25-29, 44-49, 52-55, 57-66, 68, 69, 74, and 78-80 under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being obvious over Lee et al, U.S. Patent 5,395,919 ("Lee").<sup>1</sup>

As amended, claims 1-7, 9, 11, 13-15, 25-29, 44-49, 52-55, 57-66, 68, 69, 74, and 78-80 cover blends including first and second PHAs. The second PHA includes at least a first comonomer and a second comonomer. One of the first and second comonomers is of formula

(V): 
$$\begin{array}{c} \text{R}^2 \quad \text{H} \quad \text{O} \\ | \quad | \quad || \\ -\text{O}-\text{C}-\text{C}-\text{C}- \\ | \quad | \quad | \\ \text{H} \quad \text{H} \quad \text{p} \end{array}$$
, in which p is 2 or 3 and R<sup>2</sup> is H or C<sub>1</sub>-C<sub>6</sub> alkyl. In other words, the second PHA includes a 4-hydroxycarboxylate or a 5-hydroxycarboxylate. Lee describes that poly(3-hydroxybutyrate) can be blended with a PHA. See column 9, lines 43-48. However, the PHA described in Lee includes 11 different comonomers, all of which are 3-hydroxycarboxylates. See Table 1. Lee does not disclose or suggest a PHA in which a comonomer is a 4-hydroxycarboxylate or a 5-hydroxycarboxylate, as required by amended claims 1-7, 9, 11, 13-15, 25-29, 44-49, 52-55, 57-66, 68, 69, 74, and 78-80. Thus, these claims are not anticipated or rendered obvious by Lee. Accordingly, Applicant requests reconsideration and withdrawal of this rejection.

The Examiner rejected claims 1-7, 9, 13, 14, 20-29, 36-49, 52-56, 58-64, and 75-82 under 35 U.S.C. §103(a) as being obvious over Noda et al, U.S. Patent 6,808,795 ("Noda").

As amended, claims 1-7, 9, 13, 14, 20-29, 36-49, 52-56, 58-64, and 75-81 cover blends including first and second PHAs. The second PHA includes at least a first comonomer and a second comonomer. One of the first and second comonomers is of formula (V):

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<sup>1</sup> Applicant cancelled claim 10, so the rejection of these two claims should be withdrawn.

$$\text{—O—}\overset{\text{R}^2}{\underset{\text{H}}{\text{C}}}\text{—}\left(\overset{\text{H}}{\underset{\text{H}}{\text{C}}}\right)_p\text{—}\overset{\text{O}}{\parallel}{\text{C}}\text{—}$$
, in which p is 2 or 3 and R<sup>2</sup> is H or C<sub>1</sub>-C<sub>6</sub> alkyl. The blend contains from about 25% by weight to about 49% by weight of the second PHA.

Noda describes a blend containing a first PHA, a polylactic acid (i.e., a poly(2-hydroxypropanoate)), and optionally a second PHA. *See, e.g.,* the abstract and claims 1 and 3. The first PHA is a copolymer containing at least two randomly repeating monomer units. *See, e.g.,* column 4, lines 3-6. The second PHA is a homo- or copolymer. *See, e.g.,* column 5, lines 12-15. In other words, the first PHA described in Noda corresponds to the second PHA required by the pending claims (which is also a copolymer) and the second PHA described in Noda corresponds to the first PHA required by the pending claims (which also can be a homo- or a copolymer). However, Noda teaches that “[i]f the second polyhydroxyalkanoate copolymer is used as described above, a majority of the PHA composition comprises the first biodegradable polyhydroxyalkanoate copolymer, ...” *See* column 6, lines 6-9; emphases added. Noda also teaches that an example of the PHA composition includes from about 0.01 to about 10 weight percent of the second PHA copolymer (i.e., from about 90 to about 99.99 weight percent of the first PHA, which corresponds to the second PHA required by the pending claims), based on the total weight of the first and second PHA copolymers. *See* column 6, lines 13-16. Noda does not disclose or suggest a blend containing from about 25% by weight to about 49% by weight of the second PHA required by claims 1-7, 9, 13, 14, 20-29, 36-49, 52-56, 58-64, and 75-81. Indeed, given that Noda teaches that a majority of the PHA composition includes the first PHA (which corresponds to the second PHA required by the pending claims), it teaches one skilled in the art away from blends containing from about 25% by weight to about 49% by weight of the second PHA required by claims 1-7, 9, 13, 14, 20-29, 36-49, 52-56, 58-64, and 75-81. Thus, these claims are not obvious over Noda.

Claim 82, as amended, covers blends including a first PHA that includes 3-hydroxybutyrate and a second PHA that includes poly(3-hydroxybutyrate-co-3-hydroxyvalerate-co-3-hydroxyhexanoate) or poly(3-hydroxybutyrate-co-3-hydroxyhexanoate-co-3-hydroxyoctanoate-co-3-hydroxydecanoate-co-3-hydroxydodecanoate-co-3-hydroxydodecenoate). Noda does not disclose or suggest blends containing a PHA that includes

the terpolymer or hexapolymer required by amended claim 82. Thus, amended claim 82 is not obvious over Noda.

Accordingly, Applicant requests reconsideration and withdrawal of this rejection.

The Examiner rejected claims 1-37, 44-49, 52-73, and 78-82 under 35 U.S.C. §103(a) as being obvious over Hammond, U.S. Patent 5,646,217 ("Hammond").<sup>2</sup>

As amended, claims 1-7, 9, 11, 13-29, 36, 37, 44-49, 52-73, and 78-81 cover blends including first and second PHAs. The first PHA includes 3-hydroxybutyrate. The second PHA includes at least a first comonomer and a second comonomer. One of the first and second

comonomers is of formula (V): 
$$\text{---O---}\overset{\text{R}^2}{\underset{\text{H}}{\text{C}}}\text{---}\left(\overset{\text{H}}{\underset{\text{H}}{\text{C}}}\right)_p\text{---}\overset{\text{O}}{\underset{\text{H}}{\text{C}}}\text{---}$$
, in which p is 2 or 3 and R<sup>2</sup> is H or C<sub>1</sub>-C<sub>6</sub> alkyl. In other words, the second PHA copolymer includes a 4-hydroxycarboxylate or a 5-hydroxycarboxylate. In addition, the blend contains from about 25% by weight to about 49% by weight of the second PHA.

Hammond describes a polymer blend containing a first PHA, optionally a second PHA, and a transesterification catalyst. *See, e.g.,* the Abstract. The first and second PHAs can include units of formula (I): -O-C<sub>m</sub>H<sub>n</sub>-CO- (I), in which m is in the range 1-13 and n is 2m or (if m is at least 2) 2m-2. *See, e.g.,* column 1, lines 35-40. However, Hammond does not disclose or suggest a polymer blend containing a first PHA polymer having 3-hydroxybutyrate and a second PHA copolymer having a 4-hydroxycarboxylate or a 5-hydroxycarboxylate, a limitation required by claims 1-7, 9, 11, 13-29, 36, 37, 44-49, 52-73, and 78-81. Indeed, in all of its Examples, Hammond teaches blends containing a homopolymer of 3-hydroxybutyric acid and a copolymer of 3-hydroxybutyric acid and 3-hydroxyvaleric acid, both of which are polymers based on 3-hydroxycarboxylates, not 4-hydroxycarboxylates or 5-hydroxycarboxylates. In addition, Hammond teaches that each PHA component can be present in the blend in the amounts from 5-90 preferably 20-80 w/w. *See* column 3, lines 8-10. Hammond does not disclose or suggest that one of the PHAs is in the amount from about 25% by weight to about 49% by weight of the blend, another limitation required by claims 1-7, 9, 11, 13-29, 36, 37, 44-49, 52-73, and 78-81. Thus, in view of Hammond, one skilled in the art would not have been motivated to modify

<sup>2</sup> Applicant cancelled claims 8, 10, 12, and 30-35, so the rejection of these claims should be withdrawn.

Hammond to provide the blends covered by claims 1-7, 9, 11, 13-29, 36, 37, 44-49, 52-73, and 78-81. Accordingly, these claims are not obvious over Hammond.

Claim 82, as amended, covers blends including a first PHA that includes 3-hydroxybutyrate and a second PHA that includes poly(3-hydroxybutyrate-co-3-hydroxyvalerate-co-3-hydroxyhexanoate) or poly(3-hydroxybutyrate-co-3-hydroxyhexanoate-co-3-hydroxyoctanoate-co-3-hydroxydecanoate-co-3-hydroxydodecanoate-co-3-hydroxydodecenoate). Hammond does not disclose or suggest blends containing a PHA that includes the terpolymer or hexapolymer required by amended claim 82. Thus, amended claim 82 is also not obvious over Hammond.


Accordingly, Applicant requests reconsideration and withdrawal of this rejection.

Applicant submits that the application is now in condition for allowance, which action is requested.

The Petition for Extension of Time fee is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges to deposit account 06-1050, referencing Attorney's Docket No. 14074-014001.

Respectfully submitted,

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